Fact Sheet

Dealing with Uncertainity When Delineating a Wellhead Protection Area

The goal of Wellhead Protection is to protect the people and environment of Indiana. One of the first steps in wellhead protection program development is to delineate a wellhead protection area. Within this wellhead protection area management measures are applied to protect the ground water from contamination. From 327 IAC 8-4.1-1 - *Wellhead Protection Area means the surface and subsurface area …which contributes water to a CPWSS production well or wellfield …within a specified period.*

The wellhead rule was designed so that when modeling the wellhead area existing information could be used to estimate input parameters. Even when gathering site specific information, model parameters can never be precisely known. Variations in measured data are either an indication of measurement uncertainty or the result of real physical differences. Using the range of data values that reflects the data variability to bracket the model results assures that the wellhead protection area includes the area that contributes water to the well. This method produces a conservative approach that recognizes the uncertainty inherent in modeling and displays a firm understanding of the goals of groundwater modeling to develop a wellhead protection area.

EXAMPLE

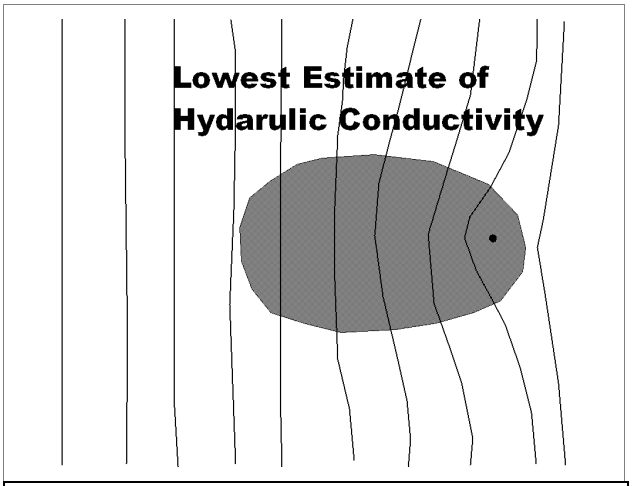

Figure 1 Use the lowest estimate of hydraulic conductivity to determine the width of the protection area

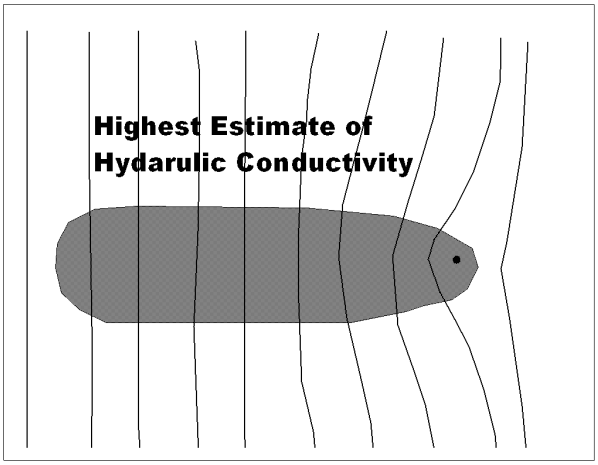

Figure 2. Use of the highest estimate of hydraulic conductivity to determine the length of the protection area.

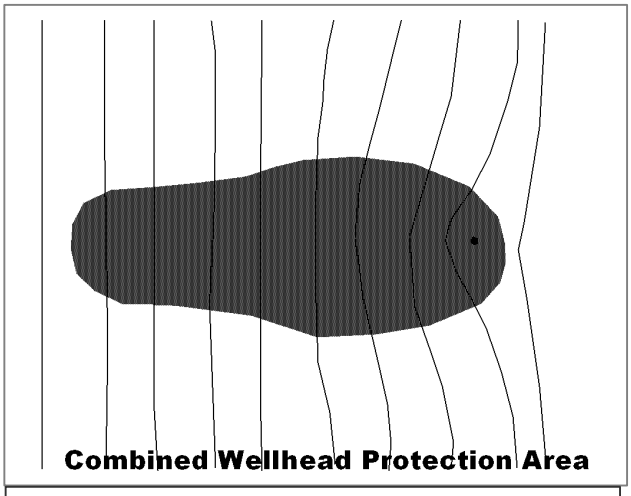

Figure 3. Use the two delineations to create the combined wellhead protection area.

Other parameters where uncertainly most commonly needs to be examined are transmissivity, recharge rates, boundary conditions, ground water flow direction and gradient and porosity.